

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

Commercially, high density polyethylene is produced using heterogeneous Ziegler-Natta catalysts of titanium or chromium compounds. The productivity of these catalysts has been significantly improved and they produce polyethylene with broad molecular weight distribution. On the other hand soluble Ziegler-Natta catalysts base on metallocene and aluminoxane have been reported to be much more active than some heterogeneous catalysts and they produce polymers with narrow molecular weight distributions. Better understanding in the conditions by providing the optimum catalytic activity is required. In this research, ethylene polymerization by Ziegler-Natta catalyst in homogeneous system are summarized as follows:

1. Catalytic activity remarkably increase with increasing Al/Zr mole ratio. At high Al/Zr mole ratio, the catalytic activity increase because methylaluminoxane (MAO) is probably described as establishing a stabilizing environment for the metallocene cation or cation-anion pair and reducing bimolecular deactivation. But trimethylaluminum (TMA) in system is much, it can be reduce the activity. The catalytic activity is highest at Al/Zr mole ratio of 4400.

2. Temperature and pressure that provide the highest activity are 55 °C and 40 psi, respectively.

3. Methylaluminoxane (MAO) is more efficient than Ethylaluminoxane (EAO) because MAO generates higher active centers and is more stable than EAO.

In this study, the recommendations for further research may be given as follows:

1. The supported metallocene catalyst should be prepared to catalyze olefins polymerization.

2. Other new metallocenes for polymerization of olefins should be used to improve activity, stereospecificity, and etc.